

- 1 Lauer GM, Walker BD. Hepatitis C infection. *N Engl J Med* 2001; **345**: 41–52.
- 2 Takaki A, Weise M, Maertens G, et al. Cellular immune responses persist and humoral responses decrease two decades after recovery from a single-source outbreak of hepatitis C. *Nat Med* 2000; **6**: 578–82.
- 3 Kenny-Walsh E, for the Irish Hepatology Research Group. Clinical outcomes after hepatitis C infection from contaminated anti-D immune globulin. *N Engl J Med* 1999; **340**: 1228–33.
- 4 Godkin AJ, Smith KJ, Willis A, et al. Naturally processed HLA class II peptides reveal highly conserved immunogenic flanking region sequence preferences that reflect antigen processing rather than peptide-MHC interactions. *J Immunol* 2001; **166**: 6720–27.
- 5 Candotti D, Temple J, Sarkodie F, Allain JP. Frequent recovery and broad genotype 2 diversity characterize hepatitis C virus infection in Ghana, West Africa. *J Virol* 2003; **77**: 7914–23.
- 6 Stramer SL. NAT update: where are we today? *Dev Biol (Basel)* 2002; **108**: 41–56.

## Treatment of AIDS in conflict-affected settings: a failure of imagination

World AIDS Day last month focused on the impact of HIV on women and girls. The particular vulnerability of women to HIV during and after conflict is well-recognised. Yet conflict-affected communities have been excluded from international discourse around AIDS care and funding for treatment in resource-poor settings. Of more than 10 000 abstracts published for the 2004 International AIDS Conference<sup>1</sup> in Bangkok, only one reported on treatment of AIDS in a conflict setting.

One in four African countries, many with a high prevalence of HIV, are currently affected by conflict.<sup>2</sup> In the Democratic Republic of Congo alone, 24 million people are directly affected by conflict and almost 4 million are displaced. Even in apparently stable countries and communities, AIDS treatment programmes can experience instability and conflict in the coming years—the risk exacerbated by poverty and HIV.

Conflict-affected populations are highly vulnerable to HIV infection and there is increasing recognition of the importance of addressing this situation.<sup>3</sup> Combatants have extremely high rates of HIV and sexually transmitted infections.<sup>4</sup> Rape is frequent and has been used as a weapon of war.<sup>5</sup> Vulnerability is compounded by poverty, homelessness, breakdown of social supports, and lack of access to health care. In Sierra Leone and Angola, the isolation of the populations during the conflict appears to have paradoxically protected them from the accelerating epidemic in neighbouring countries, but the postconflict period poses a great risk to the populations, during which intervention is essential.

What explains the inaction by the international community to ensure AIDS care and treatment reaches the millions living in conflict-affected settings? There has been a failure to invest in and develop models that show the feasibility of treatment in difficult settings. We risk repeating the tragic failures of imagination that led to delay in acceptance of the role of treatment in stable resource-poor settings in the 1990s.

Drawing on lessons learnt from treating tuberculosis in conflict settings,<sup>6</sup> Médecins Sans Frontières is providing comprehensive care, including antiretroviral treatment, to AIDS patients in Bukavu in eastern Democratic

Republic of Congo. Particular attention is paid to involving the patient in decisions around care and treatment. Heavy fighting erupted in May, 2004, leading to temporary evacuation of health staff and significant displacement of the population. Dedicated local staff maintained a minimum programme and an announcement was made on local radio to inform patients that the clinic would be open for the distribution of antiretroviral treatment. Delivery of antiretroviral therapy with good adherence was maintained throughout. No patients were lost to follow-up and treatment has continued without disruption since the situation stabilised. Lessons learned will further improve the programme's resilience to future disruption.

Conflict-affected settings include a vast range of contexts and there is a risk that all are considered equally difficult to work in. Paradoxically, the provision of treatment itself might be simpler in certain conflict-affected settings. Refugees and internally displaced people in a closed camp are easier to access than they would be in their rural communities, allowing greater opportunity for provision of care and of HIV-awareness activities. Further, there is a lack of recognition that the now well-accepted rationale for a comprehensive approach to HIV in stable settings, with provision of treatment and prevention, has equal if not greater validity in unstable settings.

Apart from the great needs of vulnerable civilian populations, particularly of women, a few points are specific to conflict settings. It has been suggested that, for HIV-positive combatants aware of their status but unable to access care, the absence of hope of treatment means there is little to prevent them from acts of violence and sexual abuse.<sup>7</sup> Paradoxically, calls for compulsory HIV tests in armed forces<sup>8</sup> might then increase the risk of violence by these men. Conversely the potential for treatment could become a reason for infected combatants and the population to seek peace, or at least to protect a space for health-care provision. Days of tranquillity have previously been granted by warring parties<sup>9</sup> to allow poliovirus vaccination to go ahead, and community leaders in south Sudan have cited the need to protect tuberculosis programmes in negotiating peace at the local level.

**Rights were not granted to include this image in electronic media. Please refer to the printed journal.**

Reuters

The availability of treatment offers a medium for raising interest and engagement with combatants and the community around HIV testing and prevention messages. In unstable settings failure to engage rapidly with populations might mean opportunities are lost. In conflict there are many health priorities which, in the face of limited resources, often compete. Concerns about risk of resistance, lack of infrastructure, sustainability, and absence of health staff are serious and valid, but not insurmountable.

The threats of development of resistance due to poorly managed public-treatment programmes are much discussed<sup>10</sup> and underlie concerns about provision of tuberculosis and AIDS treatment in unstable settings. However, unregulated drug markets are potentially even more harmful. Recent experience in northern Afghanistan showed that almost 70% of patients entering a new programme for tuberculosis treatment required second-line treatment, having previously taken inappropriate tuberculosis regimens. Antiretroviral drugs are increasingly available in resource-poor countries, and will be marketed wherever there is demand. Nevirapine, which, when taken alone, rapidly engenders resistance,<sup>11</sup> is widely available and likely to be affordable even to the poorest. Taken as monotherapy, this drug would seriously prejudice the success of standard treatment regimens with major harm to public health. Even where operationally difficult, there-

fore, a managed programme would reduce harm through provision of an alternative source of effective treatment. The use of simple fixed-dose combinations (for both tuberculosis and HIV) will simplify treatment while minimising risks of single drugs becoming available on the market.

Robust drug-management systems that anticipate disruption will further reduce these risks. As long as patients stop all antiretroviral drugs at the same time, resistance is unlikely to develop and they will be able to restart the same treatment when the situation stabilises. Careful attention to education about the importance of correct treatment, through counselling and use of radio and other media, along with free provision of treatment, will help to ensure proper care while minimising the risks that patients will buy useless treatments should the programme be disrupted. Involvement of people living with HIV/AIDS as peer-educators and adherence counsellors reduces the need for trained health staff and helps ensure a patient-centred approach to care.

Increased international resources are needed to address prevention and treatment needs in conflict-affected populations. AIDS and tuberculosis treatments can be delivered in difficult settings, providing opportunities to promote behavioural change, stigma reduction, hope, and peace. Treatment programmes in stable settings must anticipate and be able to withstand periods of disruption. Although the difficulties and risks in ensuring treatment options must not be underestimated, they can be mitigated, and, if the goal of having 3 million on treatment by 2005 is to be met, they must be faced.

*\*Tom Ellman, Heather Culbert, Victorio Torres-Feced*  
Médecins Sans Frontières, London WC1R 5DJ, UK  
tom.ellman@msf.org

We declare that we have no conflict of interest.

- 1 International AIDS Conference, Bangkok, Thailand, July 11–16, 2004: <http://www.medscape.com/ejiashome> (accessed Dec 20, 2004).
- 2 International Crisis Group. ICG Crisis Watch No 5. Jan 1, 2004: [http://www.icg.org/library/documents/crisiswatch/crisiswatch\\_2004/crisiswatch\\_jan\\_final2.pdf](http://www.icg.org/library/documents/crisiswatch/crisiswatch_2004/crisiswatch_jan_final2.pdf) (accessed Jan 7, 2005).
- 3 Hankins C, Friedman S, Zafar T, Strathdee S. Transmission and prevention of HIV and sexually transmitted infection in war settings: implications for current and future armed conflicts. *AIDS* 2002; **16**: 2245–52.
- 4 UNAIDS. AIDS and the military. UNAIDS, 1998: [http://www.unaids.org/html/pub/publications/irc-pub05/militarypv\\_en.pdf](http://www.unaids.org/html/pub/publications/irc-pub05/militarypv_en.pdf) (accessed Jan 7, 2005).
- 5 Human Rights Watch. Rape as a weapon of war and a tool of political repression. New York: Human Rights Watch, 1995: <http://www.hrw.org/about/projects/womrep/General-21.htm#TopOfPage> (accessed Jan 10, 2005).
- 6 Hehenkamp A, Hargreaves S. Tuberculosis treatment in complex emergencies: South Sudan. *Lancet* 2003; **362** (suppl): s30–32.
- 7 International Crisis Group. HIV/AIDS as a security issue. June 19, 2001: <http://www.crisisweb.org/home/index.cfm?id=1831&l=1> (accessed Jan 7, 2005).
- 8 International Crisis Group. HIV/AIDS as a security issue in Africa: lessons from Uganda. April 16, 2004: <http://www.crisisweb.org/home/index.cfm?id=2606&l=1> (accessed Jan 7, 2005).

- 9 Tangermann R, Hull HF, Jafari H, Nkowane B, Everts H, Aylward RB. Eradication of poliomyelitis in countries affected by conflict. *Bull World Health Organ* 2000; **78**: 330–38.
- 10 Harries AD, Nyangulu DS, Hargreaves NJ, Kaluwa O, Salaniponi FM. Preventing antiretroviral anarchy in sub-Saharan Africa. *Lancet* 2001; **358**: 410–14.
- 11 Chaix ML, Ekouevi DK, Peytavin G, et al. Persistence of nevirapine-resistant virus and pharmacokinetic analysis in women who received intrapartum NVP associated to a short course of zidovudine (ZDV) to prevent perinatal HIV-1 transmission: the Ditrane Plus ANRS 1201/02 Study, Abidjan, Cote d'Ivoire. *Antiviral Ther* 2004; **9**: S176 (abstr 160).

## Poly-ticks: Blue State versus Red State for Lyme disease

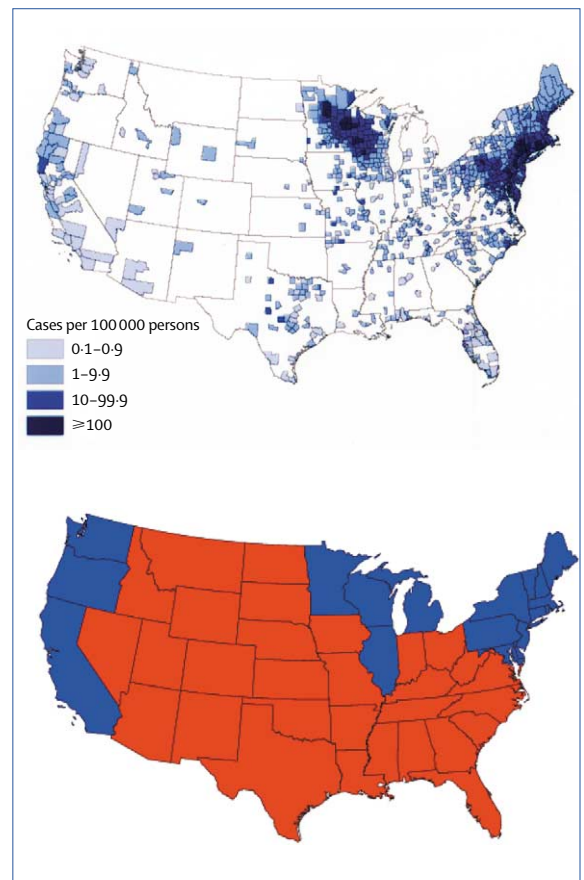
Lyme disease, caused by the spirochaete *Borrelia burgdorferi*, is the most common vector-borne disease in the USA. In 2002, 23 763 cases were reported, with patients diagnosed in every state except Montana, Hawaii, and Oklahoma.<sup>1</sup> Most cases were concentrated in the north-eastern, middle Atlantic, north central, and Pacific states, a pattern remarkably similar to the distribution of Blue States (Kerry) in the Presidential election in 2004 (figure). Interestingly, the 19 states won by Kerry accounted for over 95% of the total number of cases of Lyme disease. The inauguration on Jan 20 of the victor, from Texas, the Lone Star State, turned our minds to the cause of Lyme disease.

Besides a different voting behaviour, most of the Red States (Bush) also have a different kind of "Lyme disease". *B burgdorferi* does not appear to be the cause of indigenous cases of Lyme disease in any southern state, besides, possibly, Virginia. Although patients with suspected Lyme disease in the south often have a skin lesion regarded as indistinguishable from erythema migrans, such rashes are frequently preceded by the bite of an *Amblyomma americanum* tick (the Lone Star tick),<sup>2</sup> which is not a competent vector for *B burgdorferi*.<sup>3</sup> Therefore, although fulfilling the surveillance case-definition and tabulated as Lyme disease,<sup>1</sup> this rash is more appropriately named southern-tick-associated rash illness (STARI). An alternative name is Master's disease, in recognition of a key investigator, Edwin Masters. The cause of STARI, although sometimes attributed to a *Borrelia* species other than *B burgdorferi*, remains unclear, as does its management.<sup>4</sup>

It is important to recognise that the range of *A americanum* extends well beyond the Red States and as far north along the eastern seaboard as Maine. "Lyme disease" cases have followed the bite of this tick in both New Jersey and Maryland,<sup>5</sup> suggesting that cases of erythema migrans in some Blue States are not exclusively due to *B burgdorferi* infection. A strong recommendation can be made for further study of STARI and of Presidential elections.

\*Robert B Nadelman, Gary P Wormser  
 Department of Medicine, Division of Infectious Diseases,  
 New York Medical College, Valhalla, NY 10595, USA  
 robert\_nadelman@nymc.edu

We declare that we have no conflict of interest. Our fee for writing this Comment is being donated to the Disasters Emergency Committee Tsunami Earthquake Appeal.



**Lyme disease incidence in USA and Presidential election results, 2004**  
 Upper=incidence (per 100 000) of Lyme disease by county of residence, USA, 2002;<sup>1</sup> lower=US Presidential election results by state, 2004 (red=Bush, blue=Kerry).

- Centers for Disease Control and Prevention. Lyme disease—United States, 2001–2002. *MMWR Morb Mortal Wkly Rep* 2004; **53**: 365–69.
- Masters E, Granter S, Duray P, Cordes P. Physician-diagnosed erythema migrans-like rashes following lone star tick bites. *Arch Dermatol* 1998; **134**: 955–60.
- Piesman J, Sinsky RJ. Ability of *Ixodes scapularis*, *Dermacentor variabilis*, and *Amblyomma americanum* (Acari:Ixodidae) to acquire, maintain, and transmit Lyme disease spirochetes (*Borrelia burgdorferi*). *J Med Entomol* 1988; **25**: 336–39.
- Wormser GP, Masters E, Liveris D, et al. Microbiologic evaluation of patients from Missouri with erythema migrans. *Clin Infect Dis* (in press).
- Schulze TL, Bowen GS, Bosler EM, et al. *Amblyomma americanum*: a potential vector of Lyme disease in New Jersey. *Science* 1984; **224**: 601–03.